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Spammer pays Microsoft \$7m

Scott Richter, a spammer who sent nearly 40 billion junk emails last year, has paid Microsoft \$7 million (around £3.8m) in an out-of-court settlement. The Windows giant, along with New York's attorney general, Elliot Spitzer, sued him for \$18 million (around £9.7m) in 2003.

"People engage in spam to make money. We have now proven that we can take one of the most profitable spammers and separate him from his money. And I think that sends a powerful message to others who might be tempted to engage in spam," said Microsoft counsel Brad Smith.

Microsoft said it would use the settlement cash to continue its battle against spammers, which includes setting traps such as dummy email addresses to collect spam to use in evidence. Microsoft says it has filed more than 135 lawsuits against spammers around the world and has won \$838 million (around £455m) in settlements.

Richter's company, the Colorado-based OptInRealBig.com, is believed to be perhaps the third largest in the world. However, under the terms of the settlement the company did not acknowledge any wrongdoing. Richter said his company would not break any spam control laws in the US and promised to avoid sending spam to anyone who had not confirmed they wanted to receive it. He also agreed to let US authorities monitor his business for three years.

"In response to Microsoft's and the New York attorney general's lawsuits, we made significant changes to OptInRealBig.com's emailing practices and have paid a heavy price. I am committed to sending email only to those who have requested it and to complying fully with all federal and state anti-spam laws," said Richter.

Richter may have lost \$7 million but the original Microsoft suit was for \$18 million and



Spitzer estimates that Richter made millions of dollars a month through his spam business. Spitzer's assistant attorney general, Stephen Kline, admitted that "there will be other spammers who step in and take some of the business [Richter] was doing," but he claimed the case was still a significant victory as Richter would not be replaced by anyone with similar resources.

Anti-spam group Spamhaus said that even with Microsoft's actions, spam will make up 95 per cent of all email worldwide by next summer. A spokesperson said the UK's 2004 anti-spam legislation was so flawed that no spammers have been prosecuted under it.

Google launches VoIP chat service

Google has launched a beta release of Google Talk, an instant messaging client with support for voice chats to other Google Talk users. The new service could be a rival to Voice over IP (VoIP) services such as Skype, which offer free phone calls over the net.

Google offers a Windows-only instant messaging (IM) client, while Linux and Mac users can use the GAIM and iChat/Adium programs respectively to communicate with Google Talk users, as the messaging network is compatible with the open-source Jabber protocol. Users need a Gmail account, which provides the unique ID necessary to log into Google Talk, whether they use Google's own IM client or a third-party program.

Google's IM service is basic and lacks features such as videoconferencing, which rival services from AOL, MSN and Yahoo! offer. However, Google says

its service offers superior sound quality for voice calls and is the first service from a major company to support Jabber. Google said its IM service was intended to spur the adoption of a common, non-proprietary standard such as Jabber, which could replace today's non-compatible networks. Google Talk's insistence that users have a Gmail address means they can't message other Jabber users.

Rather strangely, Google Talk chats are not indexed and can't be searched by Google's Desktop search tool, which indexes AOL and MSN Messenger chats. Google declined to say when it would add this feature to its own IM service.

Microsoft responded with MSN Messenger 7.5, which includes new features including Voice Clip, which lets users record 15-second audio clips and send them to buddies like an instant message.

"It's designed to feel exactly like an instant message, except you trade in your hands and eyes for your voice and ears," said Leah Pearlman, MSN Messenger's program manager. Audio quality has been improved, along with security. Users can now block file transfers and discard hyperlinks, both of which have been used to spread viruses.

Microsoft's director of global sales and marketing, Adam Sohn, said that Google has a long way to go to catch up with MSN Messenger, which has more than 170 million users worldwide. He noted that Google needs to develop an IM service to attract and keep hold of users but added that "at MSN, we have been focused on building MSN Messenger and other communication services for 10 years and continue to invest and innovate".

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Intel moves to reduce chip power

Intel has announced that it will incorporate power-saving technology in all its new processors promised for next year. Its focus will no longer be on faster chip speeds but a reduction in the heat the processor generates. "We need to think about measuring performance against a new metric, and that is performance per watt," said Intel CEO Paul Otellini at August's Intel Developer Forum.

Intel's approach is driven by several trends, notably the move towards portable computers, which require lower heat output and better battery life. Otellini said Intel was developing laptop processors that consume as little as five watts, while desktop systems will use a maximum of 65 watts and servers 80 watts.

Otellini promised a future chip design that, while still capable

of running x86 software, should be able to deliver 10 times better performance per watt than even the new chips scheduled for release next year. He promised portables that run for up to eight hours between battery charges in the near future. Cooler chips will also appeal to companies that make blade servers, as well as businesses that are trying to sell media PCs, which need to run quietly with no cooling fans.

Performance-enhancing technologies such as Hyper-Threading, which was introduced as a major feature with the Pentium 4, were quietly dropped to save power. The new chips will be closer in design to the older Pentium III family.

Intel also promised that notebook power consumption would be greatly improved through its new Enhanced Intel Deep Sleep technology, which

uses an even lower voltage than the sleep state available in current Intel mobile processors.

Meanwhile, the chip giant has embraced multicore chips, a direction in which its rival AMD has made much progress. Intel has engaged with the idea that having two or more processors in a single chip is a more heat-efficient way to create powerful chips than ramping up processor speed. Nearly all the chips Intel has scheduled for release in 2006, with the exception of Cedar Mill, a single-core 65nm Pentium 4, will be dual-core processors.

The chips due next year include Yonah, a notebook chip and Intel's first dual-core chip, using a shared cache. AMD has not yet used a shared cache in its chips, although IBM has implemented this in its Power 4 series of dual-core chips.

IBM creates digital soul

IBM is working on technology that will enable people to carry their personal data and applications on their mobile phone or a music player such as an Apple iPod.

Dubbed the SoulPad, IBM's software lets the user connect an iPod, for example, to a host PC over a USB or FireWire cable. The SoulPad commandeers the host PC's processor, network card, keyboard and monitor, while bypassing its internal hard disk.

All new data and settings such as browser cookies and passwords generated during the session are stored on the SoulPad. Essentially it's a more seamless development on the practice of booting a computer from an external drive. The name derives from the idea of splitting the body of the host computer (processor, memory, keyboard, monitor and so on) from the soul of a system (its applications, data and settings). The

SoulPad requires around 6GB of disk space, 4GB for its operating system and 2GB for data storage.

IBM scientists tested the SoulPad on a 60GB iPod running the Knoppix Linux distribution and a Windows virtual machine

"The SoulPad is particularly good for business travellers [who] carry work between home and office by carrying a small device instead of a full PC," said an IBM spokesman.

Wikis to take on the world

Websites that members of the public can access and edit will increase in popularity, following the success of Wikipedia, the world's biggest encyclopedia. Speaking at the first international Wikimania conference in Frankfurt, Jimmy Wales, Wikipedia's founder, said the wiki phenomenon will expand further.

In just five years, the Wikipedia (<http://en.wikipedia.org>) has become the largest encyclopedia, with over 22

million entries. Thanks to the efforts of dedicated enthusiasts who adjudicate constant revisions and check facts, Wikipedia has shown how the open-source approach, which has been so successful in software development, can thrive in other areas, too.

In his keynote address to 400 delegates, Wales said other Wikimedia projects are being considered, including a new online world atlas created by members of the public,

online curricula ranging from pre-school to post-graduate level, a free-to-use collection of classical music performed by student orchestras and even a new open music format as an alternative to MP3 and Ogg Vorbis.

Wales paid tribute to the thousands of volunteers who maintain the Wikipedia, refereeing between competing entries on contentious subjects and weeding out entries posted by vandals.

NEWS

BRIEF

■ OFCOM INVESTIGATES BULLDOG BROADBAND

Ofcom has begun an investigation into broadband provider Bulldog, following a number of complaints.

The regulator will look into whether the ISP has breached two conditions of its Code of Practice: General Condition 11.1, which prohibits communications providers from billing customers for services that have not been provided; and General Condition 14.2, which requires communications providers to establish and maintain complaints-handling procedures that conform to a code of practice.

Bulldog's owner Cable & Wireless admitted that the firm has experienced problems but says it is close to resolving them. A spokesman said Bulldog would cooperate with the enquiry.

■ BBC PILOTS ONLINE TV AGE RATINGS

The BBC is to pilot a scheme to rate online versions of its TV programmes, warning parents that some material may be unsuitable for children. The corporation intends to introduce a scheme where material normally broadcast after the nine o'clock watershed is marked G for parental guidance.

The news comes after the BBC announced it was making a wide range of its programmes available for download, either as simulcasts or archived a week after broadcast through a service called MyBBCPlayer. This move addresses concerns that children will be able to download material they would not otherwise be allowed to see.

■ VIRUS WRITERS USE KATRINA DISASTER

Virus writers and spammers took advantage of the need for news on the Katrina hurricane by sending out spoof emails purporting to be news reports on the disaster.

Anyone who clicked links to read more was taken to a malicious website that tried to download Trojans on to the visitor's machine.

The emails have subject lines intended to bypass spam blockers, such as "Re: g8 Tropical storm flooded New Orleans", "Re: g7 80 percent of our city underwater" and "Re: q1 Katrina killed as many as 80 people".



NEWS

BRIEF

■ KAZAA GOES THE WAY OF GROKSTER

An Australian court has ordered Sharman Networks, the maker of the Kazaa P2P file sharing application, to modify the software to protect copyright. Federal judge Murray Wilcox said that users of the software are in breach of copyright and, crucially, that Sharman had encouraged them to be so.

The record companies that brought the case could now sue for damages to compensate for lost sales as a result of the 270 million music tracks that Sharman said have been downloaded through Kazaa in a single month.

■ DVD JON ATTACKS WINDOWS MEDIA ENCODING

Notorious software hacker DVD Jon has succeeded in removing encoding on Windows Media streams that restricts playback to Microsoft's Windows Media Player software.

John Lech Johansen, who acquired his nickname after hacking the copy protection on DVDs so that they could be copied to a computer hard disk, revealed on his website that he had reverse-engineered the encoding in order to allow people to access the content using open-source media player software.

Derk-Jan Hartman, who works on one such open-source player VideoLAN, said that he and a fellow developer had expressly asked Johansen to help.

■ UK ONLINE JOINS 24MBIT/S ADSL+

UK Online has become the second ISP to announce the imminent availability of an ADSL+ service in the UK. Less than a year ago, the ISP was the first to begin offering ADSL at 8Mbit/s, when most services were still stuck at 512Kbit/s. Since then 2Mbit/s has become the norm and 18Mbit/s (with a theoretical maximum of 24Mbit/s) reflects the transformation of the market in 2005, due in a large part to the growth of local loop unbundled (LLU) services.

Be, which was the first ISP to announce an ADSL+ service, is already online and is offering trial accounts.

Google enhances power of Desktop

Google has released a new version of the Desktop search tool it unleashed on the PC in October 2004. This version, free to download, is a self-contained program rather than an extension to a web browser. Entering characters into a dialog box triggers a pop-up menu displaying results. Microsoft won't offer this kind of search feature until it launches Windows Vista late next year.

Google Desktop can now search additional file types, including PDF files, email from Gmail, Outlook and Outlook Express, Mozilla Mail, AOL and MSN Messenger chats, Outlook calendar and address book data and

web pages visited with Firefox, Netscape and Mozilla browsers, as well as Internet Explorer.

Google has also introduced an interface feature called the Sidebar. This is a strip of icons that runs along the side of the desktop and resembles a cross between Mac OS X's Dock and Dashboard features or programs such as Desktop X and Konfabulator. The icons launch tools such as RSS news feeds, weather forecasts and stock market tickers, and programs for monitoring Gmail and Outlook mail boxes. There are also mini applications such as Scratch Pad for note taking. Google says it wants to encourage

third-party developers to create their own Sidebar applets.

According to Gartner analyst Allen Weiner, Google wants to create its own user environment within Windows and a platform for other software developers that challenges Windows, or at least Internet Explorer.

"The browser seems to be reaching the end of its useful life cycle," said Weiner. "It's not equipped to handle important developments in information. This has opened up an opportunity for a series of companies to create a platform that connects content to consumers in a way that gives [consumers] control."

Mac OS X hacked for PCs

Just two months after Apple distributed a developers' version of Mac OS X for Intel hardware, hackers managed to load it on to regular PCs in defiance of Apple's measures to prevent it. It is now possible to download a version of Mac OS X that can run on almost any modern PC if you know where to look.

Apple tried to avoid this situation by including a Trusted Platform Module (TPM) chip on the motherboard of the MacTel hardware made available to developers. These preview systems have been sent out in advance of next year's launch of Intel-based Macs. The chip acts as a sort of dangle that OS X for Intel looks for before it loads.

Hackers have posted videos of a modified version of OS X running on standard Windows hardware, including notebook and desktop PCs. Some early adopters have reported that OS X already runs faster on generic PCs than the expensive PowerPC-based Mac hardware the company sells at the moment.

The reports and videos are unlikely to be elaborately staged hoaxes. Apple's legal department sent an "amazingly aggressive email" to French Mac site MacBidouille, demanding "the immediate removal of all links to the videos showing OS X x86 booting from non-Apple certified SDK PCs". The site complied with Apple's demands, but issued a

statement that accused Apple of "denying reality".

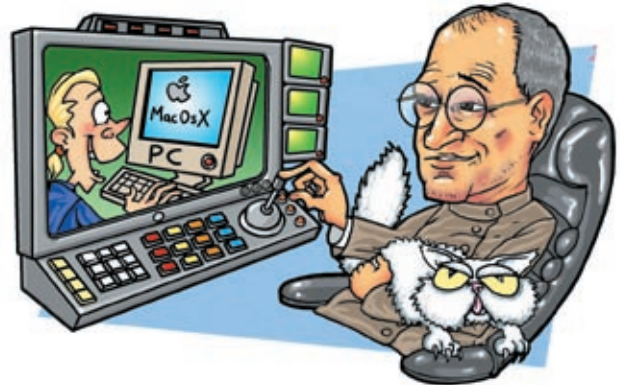
"Apple has to re-think its protections on OS X [and] also on the hardware part," said the statement. "To achieve such a dual DRM [digital rights management] based both on software and hardware protections, Apple has to develop a system quite different from today's standards to avoid any PC assembling companies [copying] it. At mid-term it will not be the ultimate solution. Someone will find a way to bypass this dual-DRM system. The only limitation will be the price of such a hack."

"All protections have always been challenged, and at the end someone [has] always successfully found a way to bypass them. It was true for Troy; it is true today for Apple."

OSx86project, a website dedicated to discussion and sharing

information on how to run OS X on standard PCs, said it had "received no communication yet [from Apple's legal department]," which it claimed was due to "our concerted effort to have this site remain a free, open and legal forum for information". But articles entitled 'Build Your Own Mac for \$199' are unlikely to avoid Apple's attentions for long.

Observers said Apple may have deliberately made the encryption protecting Mac OS X 10.4.1 for Intel easy to break as a viral marketing project. The idea is that by permitting the broader dissemination of Mac OS X on generic PCs, enthusiasts and software developers take to the OS, develop new applications and create a buzz in time for the official launch of Intel-based Macs next year. Then Apple will beef up its security measures to stop OS X running on non-Apple PCs.





Global library runs into trouble

Google's ambitious scheme to create an online version of some of the world's great libraries has run into problems over copyright issues. On 11th August the search giant announced that its Google Print for Libraries project had been suspended after six weeks of negotiations with major book publishers broke down.

At the heart of the dispute is the nature of copyright law. Google had promised to allow owners of copyrighted works to opt out, while copyright law generally requires the express consent of rights owners. Book publishers resent the prospect of having to police the activities of Google and, by implication, any other company that strikes a similar deal with a library.

"From our perspective, if it starts with Google, it never ends. Then anybody can do it and publishers have to police the world. It's a very dangerous precedent," said Adam Rothberg, VP for corporate communications at publisher Simon & Schuster.

Last December Google said it would begin digitising the contents of over 15 million books and documents from sources including Oxford

University in the UK and Michigan University, the New York Public Library and California's Stanford University in the US. Google was to underwrite the technical costs of digitising but pay no royalties to the colleges and libraries.

"As a product of this partnership, the University Library will receive and own a high-quality digital copy of the materials digitised by Google, and it will be able to provide enhanced access for University patrons," explained University of Michigan provost, Paul Courant. "The digitisation at this scale is a massive undertaking that we simply could not have achieved on our own. The University will receive no financial compensation," he added.

In return, the libraries gave Google the rights to publish out-of-copyright texts freely. For copyrighted work, Google would make the contents searchable and selected extracts would be available for free download. Users would have to pay to download an entire work.

Google Print for Libraries (<http://print.google.com>) was hailed as an imaginative breakthrough for the global dissemination of knowledge, while helping the search

giant sell online advertisements for booksellers alongside queries for copyrighted material.

Google says it has only suspended the scheme and intends to resume digitising content in November, when publishers have had time to provide a list of books they want to exclude from the project.

"The project aims to make it convenient and useful for publishers to get their books into Google Print, but those publishers who don't want to take advantage of this service can now simply tell us which books they'd like us to exclude," said Adam Smith, product manager for the Google Print project.

This has not pleased everyone. "This announcement does nothing to relieve the publishing industry's concerns," said American Association of Publishers (AAP) CEO Patricia Schroeder. "Google's procedure shifts the responsibility for preventing infringement to the copyright owner rather than the user, turning every principle of copyright law on its head."

The AAP's general counsel, Allan Adler, warned that book publishers would not rule out legal action against Google if it unilaterally resumed digitising titles in November.

Apple in stew over iPod patents

Apple faces the bizarre prospect of paying Microsoft to use iPod technology that Apple developed.

Apple's three-year efforts to patent elements of the iPod's interface were recently rejected by the US Patent and Trademark Office (USPTO) on the grounds that another inventor had filed a similar application on behalf of Microsoft in May 2002, five months before Apple's filing.

This inventor is John Platt, a senior researcher in the Knowledge Tools Group at Microsoft. Platt patented a device called AutoDJ, "a system for automatically generating music playlists based on one or more seed songs selected by a user".

The USPTO rejected Platt's application in December 2004, but an amended application was subsequently approved. Meanwhile, Apple's patent application, originally filed by Steve Jobs and other Apple executives in October 2002, was turned down by the USPTO on the grounds that it contained ideas that were too similar to the Platt patent application.

If Microsoft prevails in its battle to secure the patent, it could, in theory, levy a charge on each iPod that has ever been sold, which would mean Apple would have to pay Microsoft hundreds of millions of dollars.

David Kaefter, Microsoft's director of intellectual property licensing and business development said: "In general, our policy is to allow others to license our patents so they can use our innovative methods."

Apple signalled that it is not about to accept the situation and will certainly launch an appeal. "Apple invented and publicly released the iPod interface before the Microsoft patent application cited by the patent examiner was filed," responded Apple in a statement. Apple started selling the iPod in November 2001.

As *Shopper* went to press Creative Labs announced that it had also beaten Apple to a patent related to the iPod's interface. "The Zen Patent was awarded to Creative for its invention of the user interface for portable media players, including many of the Creative Zen and Nomad Jukebox MP3 players, and found in some competing players, such as the Apple iPod and iPod mini," it said.

NEWS

BRIEF

■ PORN PUBLISHER LASHES OUT AT GOOGLE

Porn publisher Perfect 10 is seeking an injunction against Google to stop it showing thumbnails of its copyright images in search results.

The company filed the request in an LA District Court in August 2005 as part of an ongoing copyright infringement case first brought the previous November. Perfect 10 alleges the practice involves copying, displaying and distributing thousands of its images, with many of the results linking to third-party sites that also use the images without copyright permission.

Furthermore, by displaying related advertising alongside such results Google is also making money, claims Perfect 10.

■ BITTORRENT USERS SWITCH NETWORKS

The closure of BitTorrent websites following legal action by the US movie industry and the threat of legal action against individual file sharers appear to be having the desired effect. The share of internet traffic consisting of torrents has fallen.

However, file sharers have merely exchanged one network for another, according to the latest figures from UK research group CacheLogic. EDonkey traffic is now at the same level as BitTorrent in the US, UK, China and Japan and has exceeded it in Italy, Spain, Germany and South Korea.

"This is almost assuredly a result of the increased legal action toward the once-ignored BitTorrent – a game of P2P hide-and-seek," said CacheLogic's chief technology officer Andrew Parker.

■ APPLE SETTLES \$15M BATTERY LIFE LAWSUIT

More than a million iPod owners are entitled to a free battery replacement after Apple settled a class action lawsuit in California. The lawsuit claimed Apple misled customers about the portable music player's battery life.

Owners of first, second and third-generation iPods, who have already replaced the battery or do not wish to have their battery changed, are entitled to a refund.

Eligible iPod owners should go to www.appleipodsettlement.com.



NEWS

BRIEF

CAMBRIDGE TEAM REVEALS PIN VULNERABILITY

'Tamper-proof' envelopes that banks use to send out personal identity numbers (PINs) to their customers are not as foolproof as they seem. Researchers at the University of Cambridge said that PINs can be read using a bright light and popular software.

Millions of PIN mailings are used by banks and other financial institutions to send customers new security codes linked to credit and debit cards. The number is usually printed on a background pattern and hidden beneath a tear off strip to make it hard to tamper with and still avoid detection.

Mike Bond and a team from Cambridge found that, as a result of poor printing, many numbers could be read through the tear-off strip simply by shining a bright light at a particular angle or by using simple image enhancement features found in popular graphics packages such as Photoshop.

DR WHO TO LAND ON YOUR MOBILE

Episodes of classic sci-fi programmes from the BBC are coming to a mobile phone near you. BBC Worldwide has signed a deal to license full-length episodes of cult classics such as *Doctor Who* and *Red Dwarf* to the distributor ROK Player.

Among the first batch of programmes likely to appear are the *Doctor Who* special *The Five Doctors* and three episodes from *Red Dwarf*: *Marooned*, *Quarantine* and *Cassandra*.

To view programmes, phone owners need the ROK Player, which turns the mobile into a multimedia playback device offering full-screen viewing of films, TV shows and music videos. This works via proprietary Digital Video Chip technology stored, along with audio-visual content, on the phone's multimedia memory card.

ROK Entertainment Group said the chips will work with a wide range of multimedia card-compatible phones.

The Digital Video Chips cost around £17. They will be available from Nokia stores and Choices Video, and also online from www.rokplayer.com.

Robert Moog dies

Robert Moog, the father of the synthesiser, has died. Moog, whose name rhymes with 'vogue', co-developed his first voltage-controlled synthesiser in 1964 with composer Herbert Deutsch.

Moog's company released its first commercially available synthesiser in 1965. *Switched-On Bach* by Walter Carlos, the first record created entirely from synthesised sounds, was produced on a Moog in 1968. It sold millions and showed how synthesisers could be used to produce melodies as well as atmospheric noises.

Moog sounds appeared on the tracks *Because* and *Here Comes The Sun* on the Beatles' 1969 album *Abbey Road*. A Moog was used to create the soundtrack for 1971's *A Clockwork Orange*, and on Stevie Wonder albums such as *Innervisions*. Moog synthesisers

took off in the progressive rock world after Moog produced the Minimoog in 1970, marketed as "the first compact easy-to-use synthesiser".

The Minimoog was a 44-key device with three oscillators, a choice of six waveshapes, pitch and modulation wheels. Its incorporation of a keyboard controller set the standard for commercial synthesisers. Moog pioneered standards for analogue synthesiser design such as logarithmic one-volt-per-octave pitch controls and an independent, pulse-triggering signal. The Minimoog, 13,000 of which were sold between 1971 and 1982, was a monophonic synthesiser, which meant that only one note could be played at a time.

The arrival in the mid-1980s of polyphonic digital synthesisers and the MIDI controlling system wiped

out sales of such analogue synths as the Moog. However, the classic analogue sounds of the early Moogs became fashionable again in the mid-1990s, spurring Moog to start making analogue synths again, as well as licensing Moog facsimiles as sequencer plug-in modules, such as the Arturia minimoog V.

Moog's first love was the Theremin, a difficult-to-play electronic instrument invented in the 1920s by Leon Theremin and featured on numerous sci-fi soundtracks and the Beach Boys' *Good Vibrations*. Moog assembled Theremins as a schoolboy, and his Theremin company funded his synthesiser venture, conceived as an advance on the Theremin. When his Moog business collapsed, he returned to manufacturing Theremins for enthusiasts.

Trekkies prepare to get beamed up

Viacom and Sona Mobile are to release a Star Trek Communicator Phone that looks just like the futuristic clamshell devices used by Kirk, Spock, Bones and Scotty.

The Communicators make the distinctive beeping sounds Trekkies will recognise from the TV series and movies. They will provide cutting-edge mobile phone features such as video

streaming and online *Star Trek*-themed games, plus web surfing and text messaging.

They will begin shipping in the US in October. UK availability is expected in time for Christmas. Viacom, the US broadcast giant that owns the rights to *Star Trek*, said the Communicator will be available in advance of the series' 40th anniversary next year.



Papyrus trumps technology

How do you make sure that records detailing nuclear waste, which remain highly radioactive for thousands of years, will still be readable in the far-off future? This was the challenge facing the UK Atomic Energy Authority (UKAEA) as it worked on dismantling 26 research reactors and creating secure storage for deadly radioactive nuclear waste.

The UKAEA considered and rejected various high-tech solutions. It felt it would be hard to retrieve 50-year-old mainframe data stored on magnetic tape, and it was sceptical about current storage media such as

CDs and DVDs, which are likely to become obsolete within 50 years. But there was one data format that had a record of remaining readable over thousands of years: papyrus. This was selected by nuclear scientists as the medium most likely to be readable by future generations.

Modern paper yellows and rots since it contains lignin acid. However, UK scientists developed an acid-free material called permanent paper, and it is almost the same composition as papyrus.

The UKAEA photocopied over 400 documents on to nearly 12,000

sheets of permanent paper and packed them in bags. These were then placed inside super-dry and airless archiving boxes, designed to recreate the environment of the Sahara desert.

Project leader David Gray said: "Our successors in the years and decades ahead must have access to detailed and reliable records of the stored radioactive waste as part of its long-term, safe management. For this reason, the authority carried out a thorough study of all the options before deciding on the permanent paper solution. We hope it will be adopted across the industry."